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09/693,418	10/20/2000	Brian M Burmaster	ENV 9851.1	1265

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EXAMINER
VANOY, TIMOTHY C

ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 09/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/693,418	Applicant(s) BURMASTER ET AL.
	Examiner VANOY	Group Art Unit 1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to ~~communication(s) filed on~~ THE APPLICANTS' RESPONSE DATE-STAMPED Aug. 06, 2003.

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-42 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☒ Claim(s) 1-32 is/are allowed.

☒ Claim(s) 33-42 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 4,088,743 in view of pgs. 17, 25 and 26 in Fuel Flue Gases: The Application and Interpretation of Gas Analyses and Tests edited by C. George Segeler.

Fig. 2 illustrated in U. S. Pat. 4,088,743 illustrates what appears to be the same process for producing elemental sulfur from a gas containing not only hydrogen sulfide but also the same claimed olefins, etc. (please see col. 15 lns. 55 et seq. in U. S. Pat. 4,088,743 and please also note that col. 2 lns. 45-52 in U. S. Pat. 4,088,743 also sets forth that the process described therein may also treat sour refinery gases, etc., which are known to contain the same claimed olefins of at least applicants' claim 33, and the coke oven gases embraced in the scope of gases contemplated by U. S. Pat. 4,088,743 are also known to include the toluene and xylene of applicants' claim 39, as evinced by pgs. 17, 25 and 26 in the Fuel Flue Gases book edited by Segeler), comprising the steps:

passing the hydrogen sulfide-containing gas through contact condenser 80, where the gas is washed with acidified wash water at a temperature of 40 to 150 °F, wherein the wash water is rendered acidic by receiving a portion of wash water at a pH ranging from 5.5 to 7.5 via lines 210, 230, 120, 90 and then line 100 into the contact condenser 80 (please also see fig. 2 and col. 47-56 in U. S. Pat. 4,088,743), which is submitted to inherently remove the same hydrocarbons from the same gas to the same degree;

passing the washed, hydrogen sulfide-containing gas from the contact condenser 80 to oxidation reactor 25 via lines 150, 1, 15, 18 and 24, where the hydrogen sulfide is oxidized by the air introduced in line 20 to produce elemental sulfur, while the aqueous product is separated from the gas via line 110, which is discharged via line 20, in the manner set forth in at least applicants' claim 33.

The difference between the process described in fig. 2 and the process described in col. 15 lns. 55 et seq. in U. S. Pat. 4,088,743 is that applicants' claim 33 calls for the treatment of a gas containing unsaturated hydrocarbons, whereas the process described in col. 15 lns 55 et seq. in U. S. Pat. 4,088,743 describes the treatment of geothermal steam, which is only taught to contain methane.

Col. 2 lns. 45-61 in U. S. Pat. 4,088,743 sets forth that their process is applicable to the treatment of a variety of gases, in addition to the geothermal steam mentioned in col. 15, such as sour refinery gases, etc.

Pgs. 17 and 25 in the Fuel Flue Gases book set forth that sour refinery gases contain, not only hydrogen sulfide, but also propylene and ethylene, and pg. 26 in the Fuel Flue Gases book sets forth that coke oven gases contain, not only hydrogen sulfide, but also toluene, xylene, etc.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process described in col. 15 lns. 55 et seq. and also fig. 2 in U. S. Pat. 4,088,743 *by substituting* one of the feed gases described in col. 2 lns. 45-61 in U. S. Pat. 4,088,743 *in lieu of* the geothermal steam expressly treated in the process described in col. 15 lns. 55 et seq. in U. S. Pat. 4,088,743, in the

manner embraced in the scope of at least applicants' claims 33 and 39, *because* the disclosure set forth in col. 2 lns. 45-61 in U. S. Pat. 4,088,743 fairly suggests that the authors of this patent contemplated the treatment of these unsaturated hydrocarbon-containing feed gases mentioned in col. 2 lns. 45-62 in U. S. Pat. 4,088,743.

Note that the washing water extracted from the "SO_2 scrubber" 180 is expected to inherently contain the same sulfuric acid recited in applicants' claim 34 in the same concentrations recited in applicants' claim 35, and produce the same sulfate salts recited in applicants' claim 34.

Note that the same sour refinery gas, etc. being treated by the process described in U. S. Pat. 4,088,743 is expected to inherently contain the same claimed unsaturated hydrocarbons in the same concentrations recited in applicants' claim 36, and that the gas is expected to inherently contain the same concentrations of unsaturated hydrocarbons after the aqueous washing step recited in applicants' claims 36-38.

Claims 33-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 4,088,743 in view of Fuel Flue Gases: The Application and Interpretation of Gas Analyses and Tests by C. George Segeler as applied to claims 33-39 above, and further in view of pgs. 18-84 to 18-90 in the Chemical Engineers' Handbook (5^{th} ed.) by Perry et al.

The difference between the applicants' claims and U. S. Pat. 4,088,743 is that applicants' claims 40-42 call for passing the gas exiting the aqueous scrubber through a mist eliminator.

Pgs. 18-84 et seq. in the Chemical Engineers' Handbook describes the use of a variety of "impingement separators" (i. e. the applicants' mist eliminator) for removing unwanted mist out of a gas.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process described in U. S. Pat. 4,088,743 *by subjecting* the washed gas exiting the contact condenser 80 to one of the mist eliminators described on pgs. 18-84 et seq. in the Chemical Engineers' Handbook, in the manner required by applicants' claims 40-42, *because* of the expected advantage of removing any mist entrained in the washed gas that managed to escape separation from the gas within the contact condenser 80.

Additionally, the limitation of wetting the mist eliminator with additional wash solution set forth in applicants' claim 42 is noted, but is obvious from pg. 18-87, 2nd column in the Chemical Engineers' Handbook, which teaches this same irrigation of the packing material within a packed bed separator for what appears to be same advantage of removing even more mist (or other components) out of the gas.

Claims 1-32 have not been rejected under either 35USC102 or 35USC103 because there is nothing in any of the references of record teaching or suggesting that the "tail gas" (48) illustrated in fig. 3 in U. S. Pat. 5,851,265 should replace the "air" (20) illustrated in fig. 2 in U. S. Pat. 4,088,743 and also that the "SO_2 absorber/SO_2 stripper" system illustrated in fig. 3 in U. S. Pat. 5,851,265 should replace the "SO_2 scrubber" (180) illustrated in fig. 2 in U. S. Pat. 4,088,743 in a manner rendering obvious (or,

alternatively, arriving at) the invention of applicants' claim 1: please see the discussion of the *In re Lintner* 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972) court decision set forth in section 2143.01 in the MPEP (8th ed.).

Response to Arguments

The applicants' arguments submitted in their response dated Aug. 06, 2003 (paper no. 15) have been considered, but are not persuasive.

a) *The applicants argue that while the examiner submitted that the disclosure set forth in col. 2 lns. 45-61 in U. S. Pat. 4,088,743 fairly suggests that the authors of this patent contemplated the treatment of these unsaturated hydrocarbon-containing feed gases mentioned in col. 2 lns. 45-61 in U. S. Pat. 4,088,743,* however *this reasoning wholly misconstrues the teachings of U. S. Pat. 4,088,743 in its figure 2 and also in its example XII where the contact of a hydrogen sulfide-containing geothermal steam with cooling water in a contact condenser is disclosed.*

The teachings of U. S. Pat. 4,088,743 is not limited to either its figure 2 or to its example XII and nor does the specific example of "geothermal steam" illustrated in figure 2 and also in example XII in U. S. Pat. 4,088,743 "teach away" from using the process illustrated in its figure 2 to treat the *other* feed gases contemplated by the patentees of U. S. Pat. 4,088,743 that the process illustrated in their figure 2 can treat – which includes the "sour refinery gases" expressly taught in col. 2 lns. 45-52 in U. S. Pat. 4,088,743): please note the discussion of the *In re Susi* 440 F.2d 442, 169 USPQ

423 (CCPA 1971) court decision set forth in section 2123 in the MPEP (Rev. 1, Feb. 2003) where it is set forth:

> "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments.".

Also note the discussion of the *Merck & Co. vs. Biocraft Laboratories* 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U. S. 975 (1989) court decision set forth in section 2123 in the MPEP (Rev. 1, Feb. 2003), which set forth:

> "A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments.".

In this case, the "sour refinery gases" set forth in col. 2 ln. 52 in U. S. Pat. 4,088,743 are part of the "all" mentioned in the above discussion of the *Merck & Co. vs. Biocraft Laboratories* 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U. S. 975 (1989) court decision that the process described in U. S. Pat. 4,088,743 reasonably suggests to one skilled in the art.

b) *The applicants argue that the figure 2 illustrated in U. S. Pat. 4,088,743 uses the wash tower 80 to condense and remove the water vapor out of the geothermal stream (which does not contain unsaturated hydrocarbons), however the applicants use their acid wash tower 5 to wash out and react unsaturated hydrocarbons in a gas with acid.*

When the patentees of U. S. Pat. 4,088,743 use their process illustrated in figure 2 to treat the "sour refinery gases" set forth in col. 2 ln. 52 in U. S. Pat. 4,088,743 (which is known to contain unsaturated hydrocarbons, as evinced by section c on pg. 17 and also table 20 on pg. 25 in the Fuel Flue Gases reference), the acidic aqueous solution (please see col. 16 ln. 47 to col. 17 ln. 12 in U. S. Pat. 4,088,743) will *inherently* react

with and remove the unsaturated hydrocarbons present in the sour refinery gases mentioned in col. 2 ln. 52 in U. S. Pat. 4,088,743, in the same manner that the applicants argue is the case for their invention. Such description of inherent/latent properties of the prior art process does not impart patentability to the claims: please see the discussion of the *In re Wiseman* 596 F.2d 1019, 201 USPQ 658 (CCPA) court decision set forth in section 2145(II) in the MPEP (Rev. 1, Feb. 2003).

c) *The applicants argue that those skilled in the art would use the process illustrated in figure 1 in U. S. Pat. 4,088,743 (which does not have a "steam condensing step") to treat the sour refinery gas, etc. and any other feed streams that are poor in steam. Those skilled in the art would not use the process illustrated in figure 2 in U. S. Pat. 4,088,743 to treat a steam-poor feed stream.*

If only water were being condensed out of the sour gas in the manner that the applicants' argument would have it, it appears that one skilled in the art would use the process of figure 1 in U. S. Pat. 4,088,743 which expressly shows water being condensed out of the sour gas being treated in condenser "21". There is nothing in either figure 2 or the description of figure 2 requiring that only water be condensed out of the sour gas being treated (in the manner that the applicants' argument would have it), but it is submitted that aqueous acid wash tower "80" illustrated in figure 2 in U. S. Pat. 4,088,743 would wash out all condensable out of the gas (not just the water/steam mentioned in the applicants' argument). This is evinced and supported by the description of the feed gases set forth in tables I, II, III, IV and V in U. S. Pat. 4,088,743

which describes the components of the sour feed gases being treated and water/steam is conspicuously missing from these listed components.

The request that the examiner contact the attorney to discuss any remaining issues is noted, but is denied since: (i) no allowable subject matter has been found in the rejected claims, and (ii) the attorney would not have the advantage of reading and studying the examiner's rebuttal of the applicants' arguments.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached at 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv
August 29, 2003

Timothy Vanoy
Patent Examiner

Art Unit 1754

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